

REMARKS

Claims 1-16 are pending in the instant application. Claims 1, 4, 7, 11, and 15 are amended herein. No new matter has been added as a result of the amendments made herein.

Specification Objections

The disclosure is objected to as containing informalities. Paragraph 0006 has been amended herein to address the objections raised by the Examiner. Consequently, the objections to the disclosure should be withdrawn.

Claim Objections

Claim 15 is objected to as containing informalities. Claim 15 has been amended herein to address the objections raised by the Examiner. Consequently, the objections to Claim 15 should be withdrawn.

103 Rejections

Claims 1-8 and 10-16 are rejected under 35 U.S.C. § 103(a) as being anticipated by Carobolante (6,084,378) and Alfrey (2003/0103364). The Applicants have reviewed the cited references and respectfully submit that embodiments of the present invention as are set forth in Claims 1-8 and 10-16 are neither anticipated nor rendered obvious by Carobolante or Alfrey.

Independent Claim 1

The Examiner is respectfully directed to independent Claim 1 which is drawn to an embodiment of the present invention that includes a differential load driving circuit, that comprises:

...at least one current source; and at least one current source switch operable to couple said at least one current source to said load; wherein said current source is coupled to said load to deliver current to said load during low current conditions at said load, and said PWM signal coupled to said load to deliver current to said load during high current conditions at said load...(Emphasis Added)

Applicants respectfully submit that neither the Carobolante reference nor the Alfrey reference anticipates or renders obvious a differential load driving circuit comprising a current source and a current source switch operable to couple the current source to a load as presently claimed in amended Claim 1.

Moreover, Applicants respectfully submit that the Carobolante reference does not disclose a circuitry having a current source and a current switch to couple the current source to a load so as to delivery current to the load during low current conditions. After reviewing the Carobolante reference, particularly referring to Col. 14, Lines 23-26 and FIG. 1 in the Carobolante reference, Applicants respectfully submit that Carobolante only discloses a circuit that may be employed to drive the coil with a PWM current in conjunction with additional circuitry to drive the coil with a linear current. Comparatively speaking, a current source switch, see FIGS. 5-8 and 10-14 in the present invention, is disclosed to couple a

current source to the load during low current conditions. Furthermore, Carobolante does not disclose any condition under which a load or a coil can be driven in a linear mode or a PWM mode. In the present invention, the linear mode is enabled during the low current conditions, and the PWM mode is enabled during the high current conditions. In other words, the limitation, “at least one current source switch operable to couple said at least one current source to said load,” or “low current conditions,” and “high current conditions,” is not disclosed in the Carobolante reference.

Alfrey does not teach or suggest a modification of Carobolante that would remedy the deficiencies of Carobolante outlined above. Moreover, nowhere in the Alfrey reference is an differential load driving circuit similar to that recited in Claim 1 taught or suggested. The circuit disclosed in the Alfrey reference is an H-bridge circuit for applying current to a load. Alfrey does not disclose or teach circuitry having a current source and a current source switch for delivering current to the load during low current conditions. Consequently, the embodiments of the Applicant’s invention as are set forth in Claim 1 are neither anticipated nor rendered obvious by Alfrey. Thus, Applicants respectfully submit that the present invention as disclosed in independent Claim 1 is not anticipated by the Carobolante reference taken alone or in combination with the Alfrey reference, and is in a condition for allowance. Moreover, Applicants respectfully submit that Claims 2-3 which depend from independent Claim 1 are also in a condition for allowance as being dependent on an allowable base claim.

Independent Claim 4

The Examiner is respectfully directed to independent Claim 4 which is drawn to an embodiment of the present invention that includes an H-Bridge load driving circuit, that comprises:

...at least one current source; and at least one current source switch operable to couple said at least one current source to said load; wherein said H-Bridge circuit having a first mode in which said current source is coupled to said load to supply current to said load and a second mode in which at least two of said power switches are coupled to said PWM signal to supply current to said load...
(Emphasis Added)

Applicants respectfully submit that neither the Carobolante reference nor the Alfrey reference anticipates or renders obvious an H-Bridge load driving circuit comprising a current source and a current source switch operable to couple the current source to a load as presently claimed in amended Claim 4.

It should be appreciated that independent Claim 4 contains limitations similar to those set forth in Claim 1 and, that these limitations are distinctly different from and non-obvious over the subject matter disclosed by the Carobolante reference, the Alfrey reference, and their combination.

Additionally, Applicants respectfully submit that Claims 5-6 which depend from independent Claim 4 are also in a condition for allowance as being dependent on an allowable base claim.

Independent Claim 7

The Examiner is respectfully directed to independent Claim 7 which is drawn to an embodiment of the present invention that includes an H-Bridge load driving circuit, that comprises:

...at least one current source; and at least one current source switch operable to couple said at least one current source to said load; wherein said H-Bridge circuit is adapted to operate in a linear mode using said at least one current source switch to enable said current source and a PWM mode wherein said switches are controlled with a PWM signal...
(Emphasis Added)

Applicants respectfully submit that neither the Carobolante reference nor the Alfrey reference anticipates or renders obvious an H-Bridge load driving circuit comprising a current source and a current source switch operable to couple the current source to a load as presently claimed in amended Claim 7.

It should be appreciated that independent Claim 7 contains limitations similar to those set forth in Claim 1 and, that these limitations are distinctly different from and non-obvious over the subject matter disclosed by the Carobolante reference, the Alfrey reference, and their combination. Furthermore, neither the Carobolante reference nor the Alfrey reference discloses a current source switch to enable a current source so as to operate a driving circuit in a linear mode. Additionally, Applicants respectfully submit that Claims 8 and 10 which depend from independent Claim 7 are also in a condition for allowance as being dependent on an allowable base claim.

Independent Claim 11

The Examiner is respectfully directed to independent Claim 11 which is drawn to an embodiment of the present invention that includes a differential driving circuit for driving a thermal electric cooler that comprises:

...at least one current source; and at least one current source switch operable to couple said at least one current source to said load; wherein said differential driving circuit having a first mode in which said at least one current source switch is enabled to couple said current source to said load to supply current to said load and a second mode in which at least two of said power switches are coupled to said PWM signal to supply current to said load... (Emphasis Added)

Applicants respectfully submit that neither the Carobolante reference nor the Alfrey reference anticipates or renders obvious an H-Bridge load driving circuit comprising a current source and a current source switch operable to couple the current source to a load as presently claimed in amended Claim 11.

It should be appreciated that independent Claim 11 contains limitations similar to those set forth in Claim 1 and, that these limitations are distinctly different from and non-obvious over the subject matter disclosed by the Carobolante reference, the Alfrey reference, and their combination. Furthermore, neither the Carobolante reference nor the Alfrey reference discloses a current source switch to enable a current source so as to operate a driving circuit in a linear mode. Additionally, Applicants respectfully submit that Claims 12-16 which depend from independent Claim 11 are also in a condition for allowance as being dependent on an allowable base claim.

To summarize, the embodiments of the invention that are set forth in independent Claims 1, 4, 7 and 11 are not anticipated or rendered obvious by Carobolante in view of Alfrey. Consequently, the rejection of Claims 1, 4, 7 and 11 under 35 U.S.C. § 103(a) is improper and Claims 1, 4, 7 and 11 are in condition for allowance. Accordingly, Claims 2 and 3 dependent on Claim 1, Claims 5 and 6 dependent on Claim 4, Claims 8 and 10 dependent on Claim 7 and Claims 12-16 dependent on Claim 11 are likewise in condition for allowance as being dependent on allowable base Claims.

Claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Carobolante (6,084,378) and Alfrey (2003/0103364) in further view of Walter (2003/0155813). The Applicants have reviewed the cited references and respectfully submit that embodiments of the present invention as are set forth in Claim 9 are neither anticipated nor rendered obvious by Carobolante, Alfrey or Walter.

Walter does not teach or suggest a modification of Carobolante and Alfrey that would remedy the deficiencies of Carobolante and Alfrey outlined above. More specifically, Walter does not teach an H-Bridge load driving circuit having at least one current source switch operable to couple said at least one current source to said load as is recited in Claim 7 (from which Claim 9 depend). Consequently, Carobolante, in view of Alfrey in further view of Walter does not anticipate or render obvious the embodiments of Applicants' invention as set forth in Claim 9 dependent on Claim 7. As such the rejection of Claim 9 under 35 U.S.C. § 103(a) is improper and Claim 9 is in condition for allowance.

Conclusion

In light of the above-listed remarks, the Applicants respectfully request allowance of the remaining Claims.

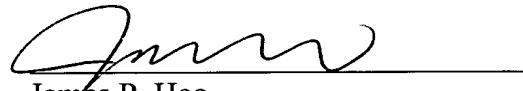
Based on the arguments presented above, Applicants respectfully assert that Claims 1-16 overcome the rejections of record. Therefore, Applicants respectfully solicit allowance of these Claims.

The Examiner is urged to contact the Applicants' undersigned representative if the Examiner believes such action would expedite resolution of the present Application.

Respectfully submitted,

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